MONITORING PLAN

PROJECT NO. T/V-03 VERMILION RIVER CUTOFF

ORIGINAL DATE: November 1, 1994
REVISED DATE: July 23, 1998

Preface

Pursuant to a CWPPRA Task Force decision on April 14, 1998, the original monitoring plan was reduced in scope due to budgetary constraints. Specifically, post-construction aerial photography was reduced from three to two, and shoreline surveys will be conducted five times post-construction.

Project Description

The Vermilion River Cutoff, near Intracoastal City, La., was constructed in 1944 to connect the Vermilion River and the Gulf Intracoastal Waterway (GIWW) with Vermilion Bay for navigational purposes. A large section of the west bank of the Vermilion River Cutoff has eroded as a result of both bay-side wave action and boat wakes within the cutoff. Erosion of the west bank of the Vermilion River Cutoff, estimated at 23.3 ft/yr (7.1 m/yr) from comparisons of 1955–1985 aerial photography, has occurred to the extent that the land bridge between the cutoff and Vermilion Bay, to the west, is breached in several places (LDNR 1991). Erosion on the east bank threatens to breach the land bridge between the cutoff and Onion Lake.

The project will attempt to stabilize the west side of the cutoff by armoring the three remaining land points adjacent to Vermilion Bay with limestone rip-rap. It will also protect the east side of the cutoff from further erosion through the use of a 8,900 ft (2,713 m) freestanding rock breakwater (figure 1). The original plan was revised when it was found that a continuous dike along the west bank would stop the flow of desirable nutrients and sediment from the cutoff into Vermilion Bay. The project is designed to directly prevent the loss of 54 ac (22 ha) of marsh as well as preserve the inherent functions and values of thousands of wetland acres, thereby protecting the integrity of the entire Onion Lake wetland complex. A similar project at Blind Lake successfully utilized a rock breakwater to prevent further erosion of an existing spoil bank.

Project Objectives

1. Maintain and protect approximately 54 ac (22 ha) of brackish marsh along the eastern side of the Vermilion River Cutoff that will contribute to protecting the integrity of several thousand acres of the Onion Lake wetland complex.

2. Prevent the Vermilion River Cutoff from widening into adjacent marshes.

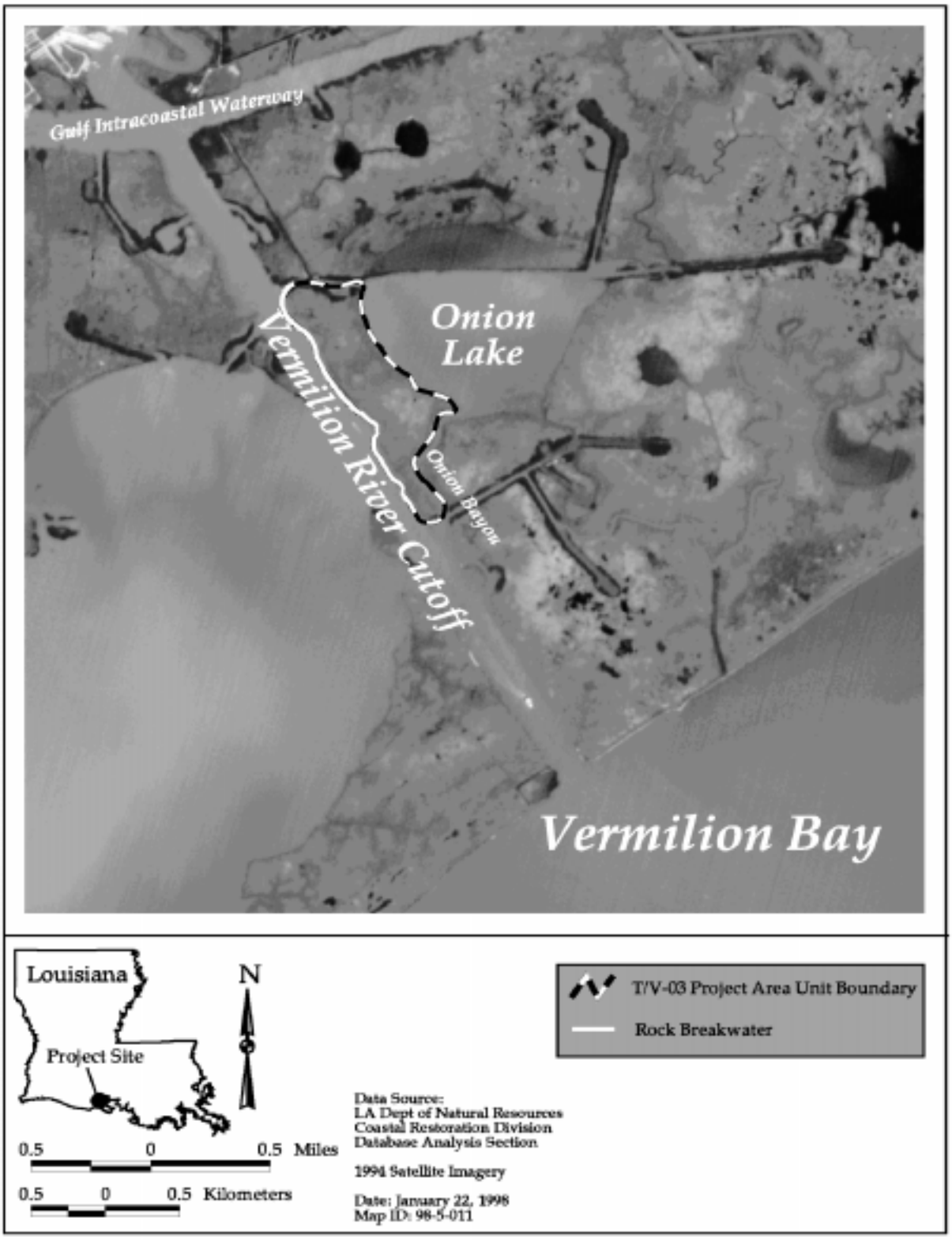

Figure 1. Vermilion River Cutoff (T/V-03) shoreline protection project.

Specific Goal

The following goal will contribute to the evaluation of the above objectives:

1. Decrease the rate of shoreline erosion along the east bank of the Vermilion River Cutoff adjacent to Onion Lake through the use of a rock breakwater.

Monitoring Elements

The following monitoring elements will provide the information necessary to evaluate the specific goals listed above:

1.	Aerial Photography	To measure vegetated and non-vegetated areas for the project area (to include near-vertical, color-infrared aerial photography at 1:12,000 maximum scale, and reference markers). Aerial photography will be georectified by National Wetlands Research Center (NWRC) personnel following procedures outlined in Steyer et al. (1995). Photography will be obtained prior to construction in 1993 and in post-construction years 2002 and 2011.
2.	Shoreline Change	To document shoreline movement, shoreline markers will be established at the vegetated marsh edge along the original shoreline adjacent to the breakwater. Shoreline position will be documented in pre-construction (1995), and post-construction years 1999, 2002, 2006, 2011, and 2015 to provide a template for mapping shoreline changes and movement over time. Shoreline positions will be compared to historical data sets available in digitized format for 1956, 1978, and 1988.

Anticipated Statistical Analyses and Hypothesis

The following hypotheses correspond with the monitoring elements and will be used to evaluate the accomplishment of the project goals.

1. Descriptive and summary statistics will be used on both historical data and data collected post-project implementation to assess changes in marsh loss/gain rates.

2. Descriptive and summary statistics will be used on historical shoreline erosion data in order to identify an area along the Vermilion River Cutoff suitable as a reference. A reference area must have an erosional history similar to that of the pre-project shoreline in the project area.

If a suitable reference area is located, descriptive and summary statistics will be used to compare annual shoreline movement (ft/yr) in the project area with that of the reference.

Descriptive and summary statistics will be used to compare measured rates of shoreline movement (ft/yr) within the project area between successive years. Also, historical values for the area as well as data available from other surveys (i.e., USACE, USFWS, LDNR, LSU) will be gathered to document and allow for statistical analysis of long-term shoreline movement along the Vermillion River Cutoff in the project area. When the H_0 is not rejected, possible negative effects will be examined.

Goal: Decrease the rate of shoreline erosion along the east bank of the Vermilion River Cutoff adjacent to Onion Lake.

Hypothesis:

H_0: Shoreline erosion rate post-construction will not be significantly less than shoreline erosion rates in previous years.

H_a: Shoreline erosion rate post-construction will be significantly less than shoreline erosion rates in previous years.

NOTE: To aid in determining overall project success, available ecological data, both descriptive and quantitative, will be evaluated in concert with the statistical analyses. This includes ancillary data collected in this monitoring project but not used directly in statistical analyses, as well as data available from other sources (i.e., USACE, USFWS, LDNR, LSU, etc.).

Notes

1.	Implementation:	Start Construction:	January 1, 1996
		End Construction:	February 15, 1996
2.	USACE Point of Contact:	Sue Hawes	(504) 862-2518
3.	DNR Project Manager:	Herbert Juneau	(318) 893-1812
	DNR Monitoring Manager:	Christine Thibodeaux	(318) 898-2493
	DNR DAS Assistant:	Mary Horton	(504) 342-4122

4. The twenty year monitoring plan development and implementation budget for this project is $91,766. Progress reports will be available in August 1996 and February 1997, and comprehensive reports will be available in February 2000, February 2003, February 2007, February 2012, and February 2016. These reports will describe the status and effectiveness of the project.

5. DNR/CRD has prints of near-vertical, aerial photography flown in 1985 (1:64,000) and on October 20, 1992 (1:12,000).

6. References:

Louisiana Department of Natural Resources 1991. Wetland Value Assessment, Tab M. Baton Rouge: Coastal Restoration Division.

Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller, and E. Swenson 1995. Quality management plan for coastal Wetlands Planning, Protection, and Restoration Act Monitoring Program. Open-file report no. 95-01. Baton Rouge, La.: Louisiana Department of Natural Resources Division. 97pp. Plus appendices.

F:\USERS\BMS_DAS\REPORTS\Monitoring Plans\TV\TV03.wpd